

## Attachment 2C

### Estimate of Groundwater Demand and Savings

#### Summary of Estimated Groundwater Savings Basin-wide<sup>1</sup>, acre-feet per year (afy)

Method/Scenario	Agricultural Pumping	Rural Residential/Small System
<b>Method 1:</b> Vineyard Acreage, 2011-2013	4,000-5,000 afy	
<b>Method 2:</b> Average Irrigated Water Demand - 15-year Projection (Set 1 Assumptions)	1,066 afy	
<b>Method 3:</b> Average Irrigated Water Demand - 15-year Projection (Set 2 Assumptions)	2,416 afy	
<b>Method 1:</b> Average Rural Residential Water Demand - 1997-2009		185 afy
<b>Method 2:</b> Average Rural Residential Water Demand - 15-year Projection (Set 1 Assumptions)		230 afy
<b>Method 3:</b> Average Rural Residential Water Demand - 15-year Projection (Set 2 Assumptions)		135 afy

1. See discussion below for explanation of methods, scenarios and assumptions

#### Methodology

The proposed ordinances would not allow any increase in acreage of irrigated agriculture unless that new water demand is offset at a 2:1 ratio. An estimate of water savings can be done in several ways. Because agricultural water use is not metered, monitored or reported, all of these estimates and projections are based on assumptions of crop acreages and water demand per acre. There are three methods used to produce these estimates of water savings:

1. Increase in vineyard acreage in the last two years (2011-2013);
2. Average estimated yearly irrigated agricultural water demand (Set 1 Assumptions);
3. Average estimated yearly irrigated agricultural water demand (Set 2 Assumptions).

A similar process was used to estimate water savings for the rural residential/small system pumping sector.

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## **Agricultural Pumping**

### **Method 1: Vineyard Acreage, 2011-2013**

According to the County Agricultural Commissioner's Office, the years 2011-2013 saw an estimated 4,000 acres of new or expanded vineyard development in the groundwater basin. The new water demand on the basin represented by this increase in acreage is estimated to be 1.0 to 1.25 acre feet per acre per year. Assuming that all of the new acreage was previously not irrigated, then the prior two years of vineyard expansion represents a water demand increase of 4,000 – 5,000 acre feet per year. If a 2:1 offset program had been in place during those years, it would have resulted in a decrease in pumping of approximately 4,000 to 5,000 acre feet per year.

### **Method 2: Average Irrigated Agricultural Water Demand Projection over 15 years (Set 1 Assumptions)**

The 2011 Resource Capacity Study used the estimates from Fugro 2010 and Todd 2009 to produce water demand "scenarios" using different water duties and assumptions. The range of future water use below is determined by using the listed assumptions.

- 1) Vineyard use: 1.0-1.25 acre feet per acre per year
- 2) Yearly increase in irrigated agricultural water use of 1.5% per year.

These assumptions result in an average increase of approximately 1,066 acre feet per year. A 1:1 offset ratio would result in no increase in water use due to the increased irrigated acreage. A 2:1 ratio would result in a yearly reduction in pumping of approximately 1,066 acre feet per year.

### **Method 3: Average Irrigated Agricultural Water Demand Projection over 15 years (Set 2 Assumptions)**

- 1) Vineyard use: 1.0-1.25 acre feet per acre per year
- 2) Yearly increase in irrigated agricultural water use of 3.0% per year

These assumptions result in an average increase of approximately 2,416 acre feet per year. A 1:1 offset ratio would result in no increase in water use due to the increased irrigated acreage. A 2:1 ratio would result in a yearly reduction in pumping of approximately 2,416 acre feet/year.

All of the preceding estimates using Methods 1, 2 and 3 are basin-wide estimates (excluding the Atascadero Sub-basin). An ordinance that addresses a smaller area of the basin would result in less water savings.

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### **Rural Residential/Small System Demand**

Using the data and assumptions in Fugro 2010 and Todd 2009, similar water savings calculations can be formulated for the rural residential/small system pumping sector. According to the 2011 Resource Capacity Study, this sector represented approximately 12.5% of total basin pumping in 2009. Methods 2 and 3 above can be used to estimate water savings from the rural residential/small system sector.

#### **Method 1: Average Rural Residential Water Demand**

According to Fugro 2010, rural domestic pumping increased from 9,601 acre feet in 1997 to 11,817 acre feet in 2009. If the proposed ordinance were in effect during this time, this increase would be offset at a 2:1 ratio. That would result in a yearly reduction in pumping of approximately 185 acre feet per year.

#### **Method 2: Average Rural Residential Water Demand Projection over 15 years (Set 1 Assumptions)**

The 2011 Resource Capacity Study estimated rural residential pumping projections over the next 15 years using different water duties. This method uses the 1.7 acre feet per year assumption.

- 1) Rural residential use: 1.7 acre feet per year
- 2) Yearly increase in rural residential pumping of 1.7% per year.

These assumptions result in an average increase of approximately 230 acre feet per year. A 1:1 offset ratio would result in no increase in water use due to the increased rural residential pumping. A 2:1 ratio would result in a yearly reduction in pumping of approximately 230 acre feet per year.

#### **Method 3: Average Rural Residential Water Demand Projection over 15 years (Set 2 Assumptions)**

The 2011 Resource Capacity Study estimated rural residential pumping projections over the next 15 years using different water duties. This method uses the 1.0 acre foot per year assumption.

- 1) Rural Residential use: 1.0 acre foot per year
- 2) Yearly increase in rural residential water use of 1.7% per year

These assumptions result in an average increase of approximately 135 acre feet/year. A 1:1 offset ratio would result in no increase in water use. A 2:1 ratio would result in a yearly reduction in pumping of approximately 135 acre feet per year.

All of the preceding estimates are basin-wide estimates. An ordinance that addresses a smaller area of the basin would result in less water savings.